# Suggestions to Advance New Fuels and Create Jobs in California IPER Hearing



Advanced Transportation Technologies

Clean Transportation Solutions SM

John Boesel
President and CEO

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#### Fuel Ethanol Program Evolution

Ethanol
Program
Implanted
(BLENDS)

Blends and Ethanol Cars (2<sup>nd</sup> oil shock) Program of Emission Controls (PROCONVE)

Blends and Flex fuel Cars

Renewable Hydrogen









Program for oil imports reduction



**Environmental Benefits** 

1975

80'S

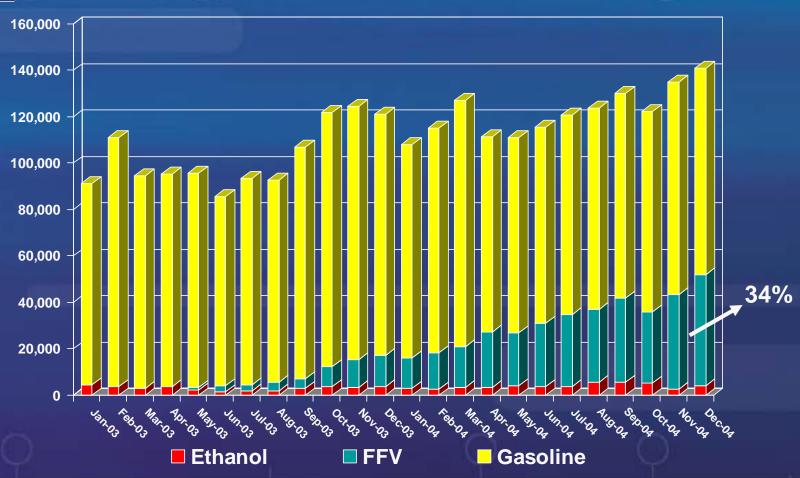
90'S

**00**'S

**Future** 



### Flex-fuel Vehicle Sales Evolution in Brazil (Jan 03-Dec 04)





## High-Blend Ethanol Use to Increase in 2005

- Approximately 200 E85 fueling stations in 20 states
  - > 100 E-85 Stations in MN
  - E85 typically \$0.35-0.40/gallon less than gasoline
- Over 4 million FFVs on U.S. roads
- 200,000 FFVs but only 1 public E85 refueling station in California
  - Why?



### What CA Should Do to Support E-85 Usage

- Develop a clear and understandable path for certifying an E-85 station
  - To date, industry is confused by CARB requirements
  - Certification costs appear very high
- Require all news cars sold to be Flex-Fuel Vehicles (FFVs)
- Minor additional cost could result in substantial benefits in terms of petroleum reduction



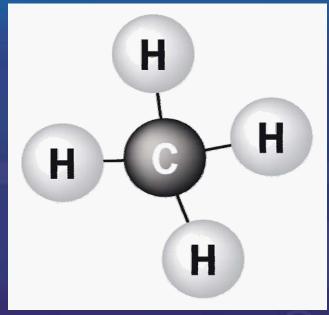
### Natural Gas = Biogas But with Some Important Exceptions

Methane

Natural gas

Fossil Fuel

Less GHG Emissions



Both Good for Air Quality!

Biogas

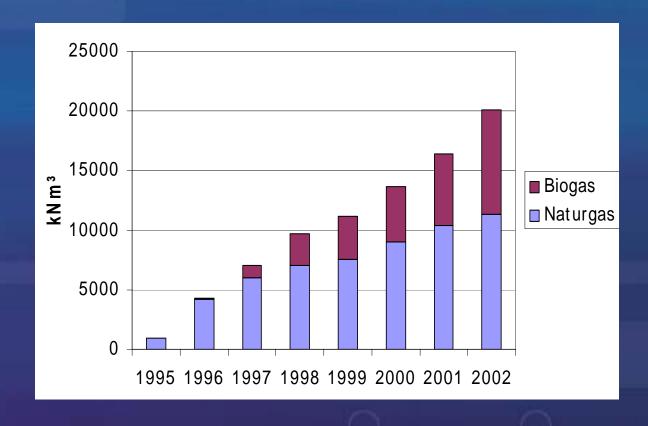
Renewable Fuel

Net zero or negative GHG Emission



### NGV Fuel Sales of Biogas vs. Natural Gas in Sweden

45% of NGV
fuel sold in
Sweden today
is biogas and
the
percentage is
increasing!





#### Tomorrow's Digester & Gas **Upgrading Process Flow**



**Multiple Sources of** 

**Processing Waste,** 

Sludge, Crops, etc.

**Organic MSW, Sewage** 

Feedstock, e.g.

Manure, Food

Misc. **Organic** Waste



**Optimized Anaerobic** Co-**Digestion** Slaughterhouse Waste,

**Bio-Fertilizer** 

**Digester** Gas



**Electricity** & Heat

**CHP Unit** 



**Biogas** 



Biogas Station

**Gas Upgrading** 

Small-Scale Liquefier



NG Pipeline



**LNG Tanker** 

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### State Actions Needed to Develop Biogas as a Transportation Fuel

- Adopt clear and enforceable means for renewable methane to be inserted in CA gas pipelines
  - State could adopt Swedish standards for biogas
  - Address any additional barriers preventing use of biogas in pipeline system
- Require that all methane from sewage treatment plants be tapped and converted to a transportation fuel or electricity



#### A Simple Sign

- Ubiquitous highway signage indicating car pools can use HOV lanes
- Clean fuel vehicles with appropriate stickers can too
  - Why don't Caltrans signs indicate that?



#### **Incentive Funding Needed**

- To support clean air goals, state created Moyer program
  - Extremely cost-effective means to reduce air pollution
  - High % of program dollars to replace old diesel engines with new ones
- Gasoline and diesel benefit from numerous subsidies and have incumbent advantage
- Time for a Moyer (Boyd/Geesman?)
   Program for Transportation Energy Security

## Clean Transportation Solutions ™ Advanced Transportation Technologies ™



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